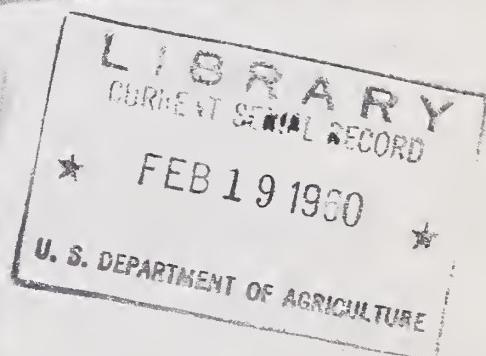


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FEDERAL - STATE - PRIVATE  
COOPERATIVE  
**SNOW SURVEY and WATER SUPPLY FORECASTS  
for  
MONTANA & NORTHERN WYOMING**

UNITED STATES DEPARTMENT of AGRICULTURE...SOIL CONSERVATION SERVICE,  
and  
MONTANA AGRICULTURAL EXPERIMENT STATION

Data included in this report were obtained by the agencies  
named above in cooperation with the Bureau of Reclamation,  
U.S. Forest Service, U.S. Geological Survey, National Park  
Service, State Engineers of Montana and Wyoming and other  
Federal, State, and private organizations.

AS OF  
**FEB. 1, 1960**

# UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

## TO RECIPIENTS OF COOPERATIVE SNOW SURVEY AND WATER SUPPLY FORECAST REPORTS:

The climate of the cultivated and populated areas of the West is characterized by relatively dry summer months. Such precipitation as occurs falls mostly in the winter and early spring months when it is of little immediate benefit to growing crops. Fortunately, most of this precipitation falls as mountain snow which stays on the ground for months, melting later to sustain streamflow during the period of greatest demand during late spring and summer. Thus, nature provides in mountain snow an imposing water storage facility.

The amount of water stored in mountain snow varies from place to place as well as from year to year and accordingly, so does the runoff of the streams. The best seasonal management of variable western water supplies results from fore-knowledge of the runoff.

A snow survey consists of a series of about ten samples taken with specially designed snow sampling equipment along a permanently marked line, about 1000 feet in length, called a snow course. The use of snow sampling equipment provides snow depth and water equivalent values for each sampling point. The average of these values is reported as the snow survey measurement for a snow course.

Snow surveys are made monthly or semi-monthly beginning in January or February and continue through the snow season until April, May or June. Currently more than 1400 western snow courses are measured each year. These measurements furnish the key data for water supply forecasts.

By relating snow survey measurements taken over a period of years to spring-summer runoff during the same period, relationships have been developed which make it possible to forecast seasonal runoff several months in advance of occurrence. In order to make a forecast, once a forecast relationship has been developed, the maximum snow water content at previously selected key snow courses is usually entered in the forecast relationship. More accurate forecasts are often obtained when other factors such as soil moisture, base flow and spring precipitation are considered and included in the forecast relationships.

Listed below are the Federal-State-Private Cooperative Snow Survey and Water Supply Forecast reports available for the West which contain detailed information on snow survey measurements, streamflow forecasts, reservoir storage, soil moisture and other guide data to water management and conservation decisions.

## PUBLISHED BY SOIL CONSERVATION SERVICE

<u>REPORTS</u>	<u>ISSUED</u>	<u>LOCATION</u>	<u>COOPERATING WITH</u>
<b>RIVER BASINS</b>			
COLORADO AND STATE OF UTAH	MONTHLY (JAN.-MAY)	SALT LAKE CITY, UTAH	UTAH STATE ENGINEER AND OTHER AGENCIES
COLUMBIA AND STATES OF IDAHO AND ALASKA	MONTHLY (JAN.-MAY)	BOISE, IDAHO	IDAHO STATE RECLAMATION ENGINEER
UPPER MISSOURI AND STATE OF MONTANA	MONTHLY (FEB.-MAY)	BOZEMAN, MONTANA	MONT. AGR. EXP. STATION
WEST-WIDE	OCT. 1, APR. 1, MAY 1	PORTLAND, OREGON	ALL COOPERATORS
<b>STATES</b>			
ARIZONA	SEMI-MONTHLY (JAN. 15 - APR. 1)	PHOENIX, ARIZONA	SALT R. VALLEY WATER USERS ASSOCIATION ARIZ. AGR. EXP. STATION
COLORADO AND NEW MEXICO	MONTHLY (FEB.-MAY)	FORT COLLINS, COLORADO	COLO. AGR. EXP. STATION COLO. STATE ENGINEER N. MEX. STATE ENGINEER
NEVADA	MONTHLY (FEB.-APR.)	RENO, NEVADA	NEVADA DEPT. OF CONSERVATION AND NATURAL RESOURCES - DIVISION OF WATER RESOURCES
OREGON	MONTHLY (JAN.-MAY)	PORTLAND, OREGON	ORE. AGR. EXP. STATION OREGON STATE ENGINEER
WASHINGTON	MONTHLY (FEB.-MAY)	SPOKANE, WASHINGTON	WASH. STATE DEPT. OF CONSERVATION
WYOMING	MONTHLY (FEB.-JUNE)	CASPER, WYOMING	WYOMING STATE ENGINEER

Copies of these various reports may be secured from: Head, Water Supply Forecasting Section  
Soil Conservation Service  
209 S. W. Fifth Ave., Portland 4, Oregon

## PUBLISHED BY OTHER AGENCIES

<u>REPORT</u>	<u>ISSUED</u>	<u>AGENCY</u>
BRITISH COLUMBIA	MONTHLY (FEB.-JUNE)	COMPTROLLER, WATER RIGHTS BR., DEPT. OF LANDS AND FORESTS, PARLIAMENT BLDG., VICTORIA, B.C., CANADA
CALIFORNIA	MONTHLY (FEB.-MAY)	CALIFORNIA DEPT. OF WATER RESOURCES, SACRAMENTO, CALIFORNIA

FEDERAL-STATE-PRIVATE COOPERATIVE  
SNOW SURVEYS and WATER SUPPLY FORECASTS  
for  
MONTANA AND NORTHERN WYOMING  
(Upper Missouri and Upper Columbia River Basins)

Report Prepared By:

A. R. Codd  
Hydraulic Engineer  
Soil Conservation Service

and

P. E. Farnes  
Hydraulic Engineer  
Soil Conservation Service

U. S. Department of Agriculture  
Soil Conservation Service  
and  
Montana Agricultural Experiment Station  
Bozeman, Montana

Report Issued By:

H. D. Hurd  
State Conservationist  
of Montana

O. W. Monson  
Irrigation Engineer  
Montana Agricultural  
Experiment Station

R. E. Huffman  
Director  
Montana Agricultural  
Experiment Station



WATER SUPPLY OUTLOOK  
as of  
February 1, 1960

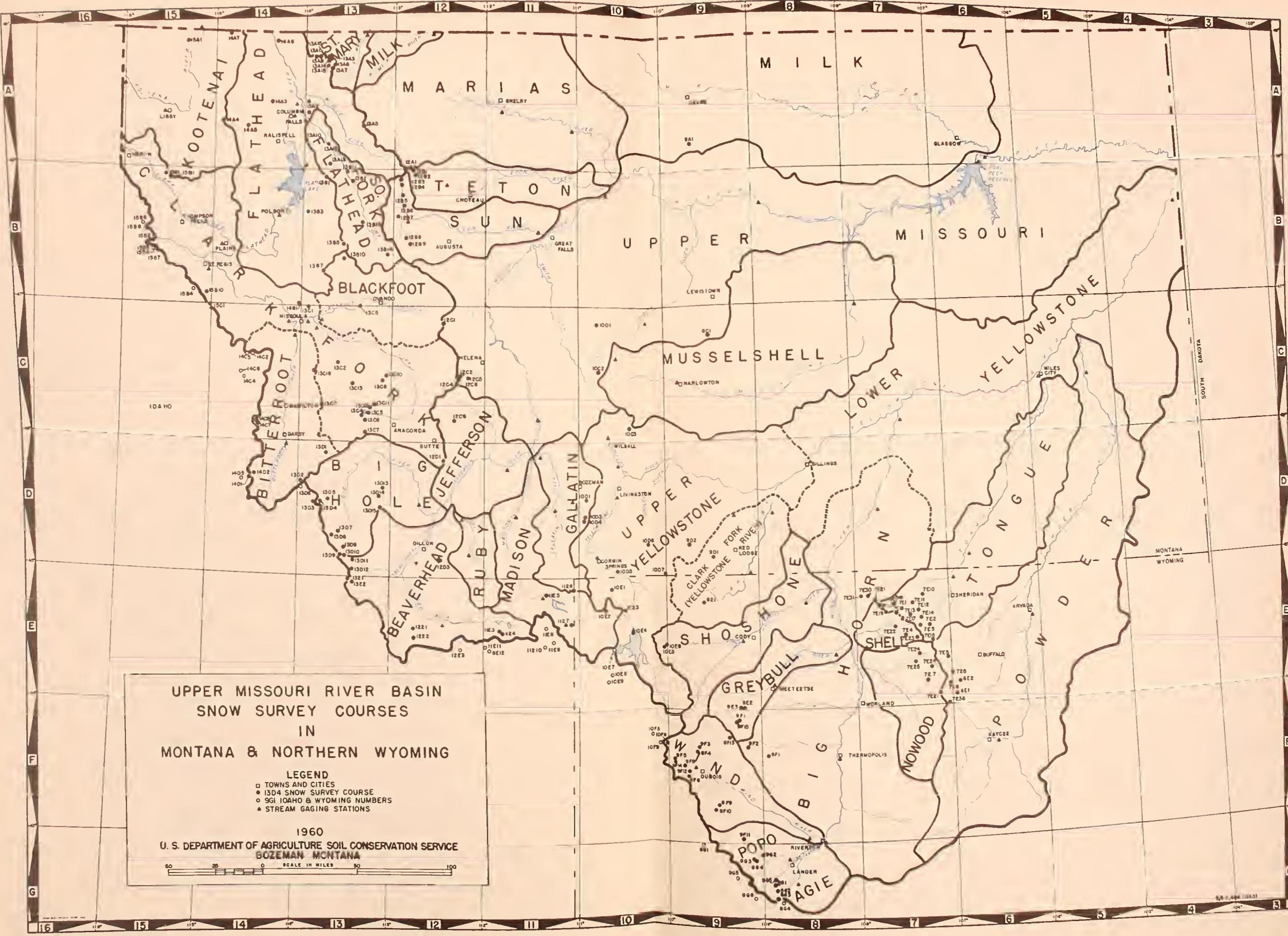
The February first 1960 snow-pack is much below average on many watersheds in Montana. The most acute exists in the Upper Yellowstone and Madison-Gallatin drainages. The water content of the snow in the Upper Yellowstone basin is 60 percent of last year and 55 percent of the 15-year average (1943-57 base period). Snow water content at West Yellowstone is the lowest in 22 years of record. At Lake and Canyon, in the Center of Yellowstone Park, snow is the lowest in 24 years of record. The Madison-Gallatin drainage is 72 percent of last year and 57 percent average.

The February first snow-pack over the Beaverhead-Jefferson drainage is about 10 percent less than last year and 25 percent less than the February first average.

West of the Divide, the outlook for an adequate water supply is somewhat brighter. Water content of the snow in the Upper Clark Fork basin is 95 percent of last year and 88 percent average. Snow-pack on the Flathead drainage is 80 percent of last year and 90 percent average.

Most irrigation reservoirs are above average and should provide an adequate water supply for maturing crops in localities where stream flow is anticipated to be below average. Localities having adequate reservoir storage can expect a short water supply unless precipitation during April, May and June is above average.





## INDEX TO MONTANA & NORTHERN WYOMING SNOW COURSES

Drainage Basin and Course Name	Montana Number	Location						Drainage Basin and Course Name	Montana Number	Location						Drainage Basin and Course Name	Montana Number	Location																								
		Elev.	Sec. Lat.	Range N.P.	Range Long.	Record Began	Measuring Dates			Elev.	Sec. Lat.	Range N.P.	Range Long.	Record Began	Measuring Dates			Elev.	Sec. Lat.	Range N.P.	Range Long.	Record Began	Measuring Dates	Measured By																		
<b>MISSOURI RIVER DRAINAGE</b>																																										
<b>MISSOURI RIVER DRAINAGE (cont.)</b>																																										
<b>(ROCK-PLAVERHEAD)</b>																																										
Lakeview Ridge	1183	7400	27	18S	2W	1948	3,4,5	10	Camp Senia	9D1	7890	2	8S	18E	1937	4	1	Horse Trail Div.	7E19	9200	29	55N	90W	1956	2,3,4,5	1																
Lakeview Canyon	1184	6930	26	18S	2W	1948	3,4,5	10	Canyon	10E3	7750	44°-44'	110°-30'	1938	1,2,3,4,5	6	6	Lake Oenova	7E16	9000	7	52N	89W	1956	2,3,4,5	1																
Lincklin	1282	6950	5	18S	9W	1948	3,4	1	Cooke City	10D7	7400	25	9S	18E	1937	1,2,3,4,5	6	North Tongue	7E15	8800	17	55N	89W	1956	2,3,4,5	1																
White Pine Ridge	1281	8850	18	18S	9W	1948	3,4	1	Crevice Mt.	10D5	8100	22	9S	9E	1935	3,4	2	Sibley Lake	7E11	8000	10	55N	88W	1956	2,3,4,5	1																
<b>(HORSE PRAIRIE)</b>																																										
Bloody Dick	13D10	7600	12	8S	16W	1948	3,4	1	Independence	10D6	8000	22	7S	12E	1940	3,4	1	Sucker Creek	7E12	9000	19	55N	87W	1956	2,3,4,5	1																
Gold Stone	13D9	8100	11	8S	16W	1948	3,4	1	Lake Camp	10E1	7850	44°-34'	110°-24'	1936	1,2,3,4,5	6	Steamboat Point	7E10	7500	32	56N	87W	1956	2,3,4,5	1																	
Lewi Pass	13E1	7600	9	10S	15W	1948	3,4	1	Lupine Creek	10E1	7300	44°-54'	110°-37'	1938	1,2,3,4,5	6	Wood Rock O.S.	7E13	8500	3	54N	86W	1956	2,3,4,5	1																	
Terrell Creek	13U12	6650	14	9S	15W	1948	3,4	1	Lodgepole	9E1	8200	32	56N	106W	1940	2,3,4,5	1	<b>(TONGUE RIVER cont.)</b>																								
Trail Creek	13E2	7090	15	10S	15W	1948	3,4	1	West Rosebud	9D2	7500	10	7S	16E	1940	1,2,3,4,5	4	<b>MISSOURI RIVER DRAINAGE (cont.)</b>																								
Passway Junction	13D11	6800	27	8S	15W	1948	3,4	1	<b>(UPPER YELLOWSTONE)</b>																																	
<b>(SNAKES RIVER)</b>																																										
Big Hole Pass	13D3	7240	28	3S	18W	1948	3,4	1	Big Warm	9F12	8800	36	42N	109W	1955	2,3,4,5	1	<b>(POWDER RIVER) Wyoming</b>																								
Big Hole Pass-Se.	13D4	6900	24	3S	18W	1948	3,4	1	Brooks Lake #3	10F8	9200	23	42N	110W	1939	2,3,4,5	1	<b>(COLUMBIA RIVER BASIN)</b>																								
East Boundary	13D5	6700	22	3S	17W	1948	3,4	1	Burroughs Creek	9F4	8800	15	42N	107W	1948	2,3,4,5	1	<b>(KOOTENAI RIVER)</b>																								
Ribbons Pass	13D2	7100	4	23	19W	1934	1,2,3,4,5	1,3	Dinwoodie	9F10	10000	21	39N	105W	1948	2,3,4,5	1	<b>(FLATHEAD RIVER)</b>																								
Jahnke Creek	13D8	7340	25	7S	16W	1948	3,4	1	Dry Creek	9F9	9500	34	42N	108W	1948	2,3,4,5	1	<b>(BEECH CREEK)</b>																								
Miner Forks	13D6	7300	24	6S	17W	1948	3,4	1	DuNoir	9F6	8750	27	42N	108W	1940	2,3,4,5	1	<b>(ELK CREEK)</b>																								
Miner Lake	13D7	6720	10	6S	16W	1945	3,4,5	1	East Fork	9F13	9200	23	42N	101W	1956	2,3,4,5	1	<b>(POSSUM CREEK)</b>																								
<b>(MISS RIVER)</b>																																										
Anderson Mdw.	13D14	7000	18	3S	12W	1948	3,4	1	Geyser Creek	9F7	8500	3	42N	109W	1948	2,3,4,5	1	<b>(POPO AGIE RIVER) Wyoming</b>																								
Elk Horn	13D15	8250	15	4S	12W	1935	3,4,5	3	Little Warm	9F8	7500	3	42N	109W	1955	2,3,4,5	1	<b>(WIND RIVER) Wyoming</b>																								
Wise River	13D13	6300	15	2S	12W	1948	3,4	1	Sheridan R.S. #1	9F5	7500	1	42N	109W	1955	2,3,4,5	1	<b>(WYOMING RIVER) Wyoming</b>																								
<b>(ROBIE RIVER)</b>																																										
Flashlight	12D3	6950	22	8S	7W	1945	3,4,5	1	Blue Ridge	802	9500	23	31N	101W	1939	2,3,4,5	1	<b>(POPO AGIE RIVER) Wyoming</b>																								
<b>MADISON RIVER</b>																																										
Rebien	11E5	6550	22	11S	3E	1934	1,2,3,4,5	3</td																																		

a. Numerals 1, 2, 3, 4, and 5 refer to January 1, February 1, March 1, April 1, and May 1.

b. Numerals refer to Agency that secures the snow survey as follows:

- |                              |                   |                                     |
|------------------------------|-------------------|-------------------------------------|
| 1. Soil Conservation Service |                   | 7. Montana Experiment Station       |
| 2. U. S. Forest Service      |                   | 8. City of Bozeman                  |
| 3. U. S. Geological Survey   |                   | 9. Dominion Water & Power Bureau    |
| 4. Montana Power Company     |                   | 10. U. S. Fish and Wildlife Service |
| 5. U. S. Indian Service      | M - Soil Moisture | 11. U. S. Bureau of Reclamation     |
| 6. National Park Service     | A - Aerial Marker | 12. Montana State Forestry School   |

COMPARISON OF SNOW COVER WITH THAT OF PREVIOUS YEARS

Summary of Snow-Survey Data by Tributary Watersheds February 1, 1960

TRIBUTARY BASINS	No. of Courses Averaged	No. Years Used	1960 Snow Water Equivalent Expressed as Percent of 1959 Average
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MISSOURI RIVER BASIN IN MONTANA

Beaverhead-Jefferson	11	5-15	90	76
Madison-Gallatin	9	4-15	72	57
Missouri Main Stem	4	15	91	91
Marias-Teton	1	15	73	82
UPPER YELLOWSTONE	12	4-15	60	55

COLUMBIA RIVER BASIN IN MONTANA

Kootenai above Libby	8	7-15	85	84
Flathead	10	5-15	80	90
Lower Clark Fork	5	6-15	64	66
Upper Clark Fork	10	5-15	95	88
Bitterroot	2	9-14	73	62



AVAILABLE SOIL MOISTURE  
as of  
February 1, 1960

Drainage Basin and Station	Station No.	Elev.	Soil Profile in Inches		Date	Soil Moisture Content in Inches About Feb. 1				Yrs
			Depth	Cap.		1960	1959	1958	Avg.	
<u>GALLATIN</u>										
College Site	11D2M	4856	54	14.5	1/30	9.7	8.8	5.8	7.5	3
<u>FLATHEAD</u>										
Marias Pass	13A5M	5250	54	8.4	1/24	6.4	6.1	4.4	5.6	3
Spotted Bear R.S.	13B15M	3700	28	5.9	2/2	5.2	4.9	3.7	4.5	3
Trout Lake	13A12M	3600	54	11.8	2/1	12.3	12.4	11.8	12.0	3

AVAILABLE SOIL MOISTURE  
as of  
October 1, 1959

<u>GALLATIN</u>	College Site	11D2M	4856	54	14.5	10/2	1959	1958	1957	Avg.
							1959	1958	1957	
<u>FLATHEAD</u>										
Marias Pass	13A5M	5250	54	8.4	10/1	5.6	4.5	3.1	4.4	4
Spotted Bear R.S.	13B15M	3700	28	5.9	9/29	4.3	3.7	1.2	2.7	3
Trout Lake	13A12M	3600	54	11.8	9/29	9.8	10.5	2.1	7.2	3



MONTANA SNOW SURVEYS ABOUT FEBRUARY 1, 1960

MISSOURI DRAINAGE

Current Information

Past Record

No.	Snow Course Name	Elev.	Date of Survey	Snow Depth (In.)	Water Content (In.)	Water Content (In.)		Years Record Used In Average
						Last Year	15-Year Average 1943-57	
<b>BEAVERHEAD-JEFFERSON BASIN</b>								
12E3	Camp Creek	6800	1/28	21	4.5	3.9	7.0	15
12C5	Chessman Res.	6200	2/1	12	3.0	2.3	3.4	15
13D2	Gibbons Pass	7100	1/27	45	9.8	14.2	16.5**	14
11E12	Kilgore	6200	1/28	20	5.1	3.6	7.2	15
13D16	Moose Creek	6200	1/27	37	8.0	10.3	12.2**	9
12C6	Picnic Grounds	6500	2/1	11	1.7	1.7	3.5**	13
12D1	Pipestone Pass	7200	1/26	18	4.2	2.2	3.2**	14
13C7	Storm Lake	7780	1/27	31	6.6	8.8	8.4**	5
12C2	Tenmile, Lower	6250	1/31	21	5.1	4.6	5.1	15
12C3	Tenmile, Middle	6800	1/30	27	6.7	7.8	7.4	15
13C4	Tenmile, Upper	8000	1/30	31	8.2	10.6	9.4	15
<b>MADISON-GALLATIN BASIN</b>								
11E9	Big Springs	6500	1/30	27	5.6	10.8	14.4	15
10D4	Devil's Slide	8100	1/31	45	13.4	14.6	11.9**	4
11E5	Hebgen	6550	1/29	24	4.8	6.2	8.6	15
10D3	Hood Meadow	6600	1/30	20	4.4	6.6	4.5**	4
11E10	Island Park	6315	1/29	26	4.8	6.8	11.3	15
10D1	New World	6700	1/29	22	5.5	6.4	6.8**	10
10E2	Norris Basin	7500	2/1	20	3.8	5.4	7.7**	8
11E6	Twenty-One Mile	7150	1/30	27	5.4	8.8	13.0	15
11E8	Valley View	6500	1/30	24	4.4	6.2	10.5**	11
11E7	West Yellowstone	6700	1/29	18	3.3	5.0	8.8	15
<b>MISSOURI MAIN STEM</b>								
12C5	Chessman Res.	6200	2/1	12	3.0	2.3	3.4	15
12C2	Tenmile, Lower	6250	1/31	21	5.1	4.6	5.1	15
13C3	Tenmile, Middle	6800	1/30	27	6.7	7.8	7.4	15
12C4	Tenmile, Upper	8000	1/30	31	8.2	10.6	9.4	15
<b>MARIAS, TETON &amp; SUN BASIN</b>								
13A5M	Marias Pass	5250	2/1	37	10.7	14.6	13.0	15

\*\* Average for years of record shown in 1943-57 base period.



MONTANA & WYOMING SNOW SURVEYS ABOUT FEBRUARY 1, 1960

No.	Snow Course Name	Elev.	Current Information			Past Record		Years Record Used In Average
			Date of Survey	Snow Depth (In.)	Water Content (In.)	Water Content (In.)	Last Year	
<u>UPPER YELLOWSTONE BASIN</u>								
10E3	Canyon	7500	2/1	23	3.9	9.8	10.9**	13
10D7	Cooke City	7400	1/30	14	2.8	5.0	6.2**	11
10D4	Devil's Slide	8100	1/31	45	13.4	14.6	11.9**	4
10E6	East Entrance	7000	1/30	18	3.5	7.3	8.8**	9
10D3	Hood Meadow	6600	1/30	20	4.4	6.6	4.5**	4
10E4	Lake Camp	7850	2/1	19	2.9	5.7	8.8**	10
9E1	Lodgepole	8200	2/1	19	3.3	6.8	-	-
10E1	Lupine Creek	7200	2/1	18	2.8	6.6	7.9**	12
10D1	New World	6700	1/29	22	5.5	6.4	6.8**	10
10E2	Norris Basin	7500	2/1	20	3.8	5.4	7.7**	8
10E5	Sylvan Pass	7100	1/30	23	4.1	9.6	10.3**	14
10E7	Thumb Divide	7900	1/30	33	7.0	12.0	15.7**	14
<u>LOWER YELLOWSTONE - WIND RIVER</u>								
9F12	Big Warm	8800	1/26	18	2.9	4.7	5.2**	5
9F4	Burrough Creek	8800	1/28	20	3.8	10.4	11.0**	11
9F10	Dinwoodie	10000	1/29	28	7.0	6.3	8.4**	11
9F17	Dinwoodie Glaciers	10000	1/29	29	7.0E	6.3	-	1
9F9	Dry Creek	9500	1/29	14	2.5	3.9	4.5**	11
9F6	DuNoir	8750	1/26	13	2.2	4.3	6.1*	15
9F7	Geyser Creek	8500	1/27	14	2.0	4.2	5.3**	11
9F8	Little Warm	9500	1/27	38	7.9	10.1	11.8**	10
9F14	Sheridan R.S. #2	7500	1/29	13	2.0	3.3	4.2**	5
9F3	T-Cross Ranch	8000	1/28	11	2.3	4.4	5.5	15
10F9	Togwotee Pass	9600	1/29	54	14.4	20.9	20.6	15
9G7	Twenty Lakes	10000	1/29	19	3.0E	2.0	-	1
<u>LOWER YELLOWSTONE - POPO AGIE RIVER</u>								
9G3	Hobbs Park	10000	2/2	38	7.6	6.9	12.0**	11
9G4	Mosquito Park R.S.	9500	2/2	23	4.1	2.8	5.5*	16
9F11	St. Lawrence R.S.	9000	2/1	17	2.4	2.0	4.6*	16
9G2	Trout Creek	8400	2/2	21	3.1	2.9	3.4**	11
9G7	Twenty Lakes	10000	1/29	19	3.0E	2.0	-	1

\* Average for 15 years of data within and adjacent to the 1943-57 period.

\*\* Average of all past data.

- Adjacent drainage.

+ Aerial stadia marker.



WYOMING SNOW SURVEYS ABOUT FEBRUARY 1, 1960

No.	Snow Course Name	Elev.	Date of Survey	Current Information		Past Record		Years Record Used In Average
				Snow Depth (In.)	Water Content (In.)	Water Content (In.)	Last Year	
<u>LOWER YELLOWSTONE - GREYBULL RIVER</u>								
9F19	Kirwin	10000	1/30	44	11.0E	-	-	-
<u>LOWER YELLOWSTONE - SHOSHONE RIVER</u>								
9E4	Carter Mountain	7800	1/26	16	3.7	1.4	-	-
10E6	East Entrance	7000	1/30	18	3.5	7.3	8.7	15
9E5	Ishawooa Cone	9200	1/30	87				
10E5	Sylvan Pass	7100	1/30	23	4.1	9.6	10.2**	16
10F9	Togwotee Pass	9600	1/29	54	14.4	20.9	20.6	24
9F18	Younts Peak	8500	1/30	50	13.5E			
<u>LOWER YELLOWSTONE - NOWOOD CREEK</u>								
7F1	Bear Trap	8000	1/27	16	3.8			
7F2	Canyon Creek	7400	1/28	24	5.5			
7E25	Cold Springs Camp	8700	2/1	16	3.7	6.5	5.4**	4
7E24	Medicine Lodge Lks.	9500	2/1	27	6.8	9.2	8.1**	4
7E8	Munkres Pass	9700	2/1	24	5.3	8.5	6.7**	5
7E27	Onion Gulch	8100	1/27	21	5.0	7.6	6.8**	4
<u>LOWER YELLOWSTONE - SHELL CREEK</u>								
7E21	Bald Mountain	9600	1/27	49	13.4	17.3	13.0**	4
7E20	Beaver-Tongue	9200	1/27	46	11.7	17.3	12.4**	4
7E18	Bone-Spring	9200	1/30	35	8.4E	13.4	11.2**	4
7E17	Granite Pass	8950	1/26	40	10.4	12.9	11.0**	4
7E23	Shell Creek	9600	1/30	32	7.7E	11.3	10.3**	4

\*\* Average of all past data.

† Adjacent drainage.

‡ Aerial stadia marker.



WYOMING SNOW SURVEYS ABOUT FEBRUARY 1, 1960

No.	Snow Course Name	Elev.	Current Information			Past Record		Years Record Used In Average
			Date of Survey	Snow Depth (In.)	Water Content (In.)	Water Content (In.)	Last Year	
<u>LOWER YELLOWSTONE - PORCUPINE CREEK</u>								
7E31	Five Springs Falls	7500	1/29	14	3.2	8.5	4.5**	4
7E30	Medicine Wheel	9000	1/28	37	9.8	16.3	10.6**	4
<u>LOWER YELLOWSTONE - TONGUE RIVER</u>								
‡ 7E20	Beaver-Tongue	9200	1/27	46	11.7	17.3	12.4**	4
7E32	Big Goose #2	7700	2/1	21	4.9	5.9	5.2**	4
‡F 7E18	Bone Spring	9200	1/30	35	8.4E	13.4	11.2**	4
7E33	Burgess R.S. #2	7900	1/29	22	5.6	7.0	5.1**	4
‡ 7E34	Dome Lake #2	8800	2/2	21	4.9E	7.5	5.9**	8
‡ 7E14	Gloom Creek	9300	2/2	31	8.0E	10.3	8.1**	4
‡ 7E17	Granite Pass	8950	1/26	40	10.4	12.9	11.0**	4
7E15	North Tongue	8800	1/28	30	7.5	11.0	N.R.	
7E11	Sibley Lake	8000	1/29	27	6.8	8.6	6.7**	4
7E10	Steamboat Point	7500	1/29	20	5.4	6.3	4.5**	4
‡ 7E12	Sucker Creek	9000	2/2	26	6.5	10.2	7.7**	4
7E13	Wood Rock G.S.	8500	1/29	29	7.6	8.5	7.0**	4
<u>LOWER YELLOWSTONE - POWDER RIVER</u>								
‡ 7F1	Bear Trap	8000	1/27	16	3.8			
‡ 7F2	Canyon Creek	7400	1/28	24	5.5			
‡ 7E36	Cloud's Peak	10000	2/2	20	5.0E			
‡ 7E28	Muddy Creek G.S.	7500	1/29	11	2.0	3.9	3.1**	4
‡ 7E8	Munkres Pass	9700	2/1	24	5.3	8.5	6.7**	5
‡ 7E27	Onion Gulch	8100	1/27	21	5.0	7.6	6.8**	4
7E5	Soldier Park	8700	2/1	16	3.3	4.6	3.2**	8
7E6	Sour Dough	8500	2/2	14	2.4	5.5	5.2**	4

\*\* Average of all past data.

‡ Adjacent drainage.

‡ Aerial stadia marker.



MONTANA SNOW SURVEYS ABOUT FEBRUARY 1, 1960

No.	Snow Course Name	Elev.	COLUMBIA DRAINAGE Current Information			Past Record		
			Date of Survey	Snow Depth (In.)	Water Content (In.)	Water Content (In.)		Years Record Used In Average
						Last Year	15-Year Average 1943-57	
<u>KOOTENAI BASIN</u>								
Can. 10	Fernie	3500	1/29	32	7.0	5.7	7.4	15
Can. 12A	Field	4200	2/1	24	7.2	6.5	4.5	15
Can. 43	Gray Creek	5100	1/28	52	12.3	11.4	13.0**	9
Can. 33	Kicking Horse	5400	1/29	44	9.4	12.5	10.7**	11
Can. 32	Marble Canyon	5000	1/29	46	6.3	11.9	11.9**	10
Can. 10A	New Fernie	4100	1/29	46	8.7	11.9	11.6**	7
Can. 8A	Sinclair Pass	4500	1/29	26	5.5	3.8	4.8**	10
Can. 20A	Sullivan Mine	5100	1/29	35	5.4	9.6	10.1**	12
<u>FLATHEAD BASIN</u>								
13B14A	Basin Creek	5000	1/28	12	3.5	5.2	7.3**	7
13A2M	Desert Mountain	5600	1/29	48	12.4	13.2	11.2**	8
Can. 10	Fernie	3500	1/29	32	7.0	5.7	7.4	15
13B13A	Holbrook	4530	1/28	22	7.5	8.2	7.6**	7
13A5M	Marias Pass	5250	2/1	37	10.7	14.6	13.0	15
Can. 10A	New Fernie	4100	1/29	46	8.7	11.9	11.6**	7
13A13	Quintonkon	3800	2/3	37	11.0	-	11.0**	5
13B2	Spotted Bear Mt.	7000	2/2	39	11.0	13.6	-	-
13A12M	Trout Lake	3600	2/1	34	11.3	13.4	11.5**	5
14B1	TV Mountain	6800	1/27	34	8.9	15.2	-	-
13B11	Twin Creeks	3580	2/1	27	8.9	11.6	8.9**	7
<u>CLARK FORK BASIN</u>								
12C5	Chessman Res.	6200	2/1	12	3.0	2.3	3.4	15
13B10	Coyote Hill	4200	1/29	23	6.6	8.8	7.9**	10
15C2	Fish Lake Airstrip	5000	1/28	60	17.0	25.9	26.6**	6
13C4	Intergaard	6450	2/1	22	5.2	4.2	5.1**	13
15B2	Lookout	5250	2/1	57	16.8	27.2	25.6	15
13C8	Lubrecht For. #6	4040	2/2	6	1.7	3.0	3.4**	6
12D1	Pipestone Pass	7200	1/26	18	4.2	2.2	3.2**	14
13C5	Southern Cross	6500	2/1	14	3.2	2.7	4.1**	13
13C7	Storm Lake	7780	1/27	31	6.6	8.8	8.4**	5
13C6	Stuart Mill	6500	2/1	18	3.6	3.7	4.4	13
12C2	Tenmile, Lower	6250	1/31	21	5.1	4.6	5.1	15
12C3	Tenmile, Middle	6800	1/30	27	6.7	7.8	7.4	15
12C4	Tenmile, Upper	8000	1/30	31	8.2	10.6	9.4	15
14B1	TV Mountain	6800	1/27	34	8.9	15.2	-	-
<u>BITTERROOT BASIN</u>								
13D2	Gibbons Pass	7100	1/27	45	9.8	14.2	16.5**	14
13D16	Moose Creek	6200	1/27	37	8.0	10.3	12.2**	9

\*\* Average for years of record shown in 1943-57 base period.



STATUS OF RESERVOIR STORAGE

February 1, 1960

BASIN & STREAM	RESERVOIR	USABLE CAPACITY 1000 A.F.	USABLE STORAGE - 1000 ACRE FEET			
			1960	1959	1943-57 Average	Yrs.
<u>COLUMBIA RIVER BASIN - MONTANA</u>						
Flint Creek	Georgetown Lake	31.0	28.6	28.3	24.0	15
S. Fk. Flathead	Hungry Horse	3428.0	3281.0	2956.0	2420.0**	5
Flathead River	Flathead Lake	1791.0	1324.0	1194.0	991.3	15
Flathead River 4/	Camas Res.	42.8	34.4	23.7	23.6	15
Flathead River 5/	Mission Valley	98.6	50.8	28.7	31.6	15
Clark Fork	Noxon	200.1	198.0E	-	-	-
<u>MISSOURI RIVER BASIN - MONTANA</u>						
Beaverhead	Lima	84.0	-	32.2	32.8	15
Madison River	Hebgen Lake	345.0	36.2#	168.2	223.3	15
Madison River	Ennis Lake	41.0	39.2	38.5	35.7	15
Hyalite Creek	Middle Creek	8.0	3.9	4.2	3.3**	7
Missouri River	Canyon Ferry	2043.0	1773.0	1699.0	1412.0**	5
Missouri River	Hauser &					
	Helena Lakes	61.9	43.6	60.1	48.8	15
Missouri River	Lake Helena	10.4	4.5	9.8	7.1**	13
Missouri River	Holter Lake	81.9	45.2	59.1	62.1	15
N.Fk. Sun River	Gibson	105.0	67.5	71.2	59.7	15
N.Fk. Sun River	Willow Creek	32.3	14.1	27.9	18.7	15
N.Fk. Sun River	Pishkun	32.0	21.9	19.8	18.9	15
Marias River	Tiber	1316.0	-	636.6	-	-
Birch Creek	Swift	30.0	25.4	-	20.9	15
Dupuyer & Birch	Lake Francis	112.0	96.1	-	94.5	15
Judith River	Ackley Lake	5.8	-	-	4.2	15
Missouri River	Ft. Peck 3/	19410.0	11020.0	8913.0	11027.0	15
Milk River	Fresno	127.2	82.5	29.4	64.0	15
Milk River	Nelson	66.8	50.2	42.5	35.6	15
W. Rosebud Cr.	Mystic Lake	20.8	9.7	11.4	11.3	15
Tongue River	Tongue River	68.0	14.0	15.4	7.5**	14
Swiftcurrent Cr.	Sherburne Lake	66.1	-	34.2	18.1	15

\*\* Average for years of record shown in 1943-57 period.

3/ Gross contents: Usable capacity less 617.0 A.F. Minimum power pool 4,500.0 A.F.

4/ Camas Reservoirs are shown as a sum of four (4) small reservoirs on the West side of Flathead Lake located on Dry Creek and Little Bitterroot River.

5/ Mission Valley Reservoirs are shown as a sum of eight (8) small reservoirs located South and East of Flathead Lake. Both Camas and Mission Valley Reservoirs are operated by the Indian Irrigation Service.

# Hebgen Reservoir being evacuated for repairs due to earthquake.



STATUS OF RESERVOIR STORAGE

February 1, 1960

BASIN & STREAM	RESERVOIR	USABLE CAPACITY 1000 A.F.	USABLE STORAGE - 1000 ACRE FEET			
			1960	1959	1943-57 Average	Yrs.
<u>MISSOURI RIVER BASIN- WYOMING</u>						
Shoshone River	Buffalo Bill	440.0	141.4	0.0	244.6	15
Wind River	Boysen	560.0AC	159.8	78.3	474.8**	5
Wind River	Pilot Butte	31.6	10.5	6.3	11.2	15
Bull Creek	Bull Lake	152.0	39.5	56.3	70.7	15
Belle Fourche	Key Hole	190.0AC	0.0	0.0	10.3**	5
<u>MISSOURI RIVER BASIN - NORTH DAKOTA</u>						
Heart River	Lake Tschida	68.7AC	44.3	42.9	51.8**	7
Heart River	E.A. Patterson	5.6AC	3.8	3.7	3.7**	6
Missouri River	Garrison Lake	18100.0AC	3820.5	2679.4	-	-
James River	Jamestown	220.0AC	8.2	12.5	-	-
<u>MISSOURI RIVER BASIN - SOUTH DAKOTA</u>						
Belle Fourche	Belle Fourche	185.2AC	27.6	32.0		
Cheyenne River	Angostura	90.0AC	17.5	46.4		
Cheyenne River	Deerfield	15.1AC	1.1	8.6		
Grand River	Shadehill	84.0AC	69.7	71.4		
Missouri River	Ft. Randall	3800.0AC	2471.5	1988.4		
Missouri River	Gavins Point	320.0AC	326.7	317.3		
Missouri River	Oahe	17000.0AC	345.0 6/	661.0 6/		
Cheyenne River	Pactola	55.0AC	23.8	18.4		

\*\* Average for years of record shown in 1943-57 base period.

AC Active Capacity, USBR Billings.

6/ Total Storage.

# Hebgen Reservoir being evacuated for repairs due to earthquake.



Agencies Cooperating in Collecting Data Contained  
in this Bulletin

U. S. Forest Service  
Region I, Missoula, Montana

U. S. Geological Survey  
Helena, Montana

U. S. Army Corps of Engineers  
Portland, Oregon  
Seattle, Washington  
Omaha, Nebraska  
Riverdale, N. D.

U. S. Indian Irrigation Service  
St. Ignatius, Montana

U. S. Weather Bureau  
Helena, Montana

U. S. Fish & Wildlife Service  
Red Rock Lakes Refuge  
Monida, Montana

U. S. Bureau of Reclamation  
Billings, Montana  
Boise, Idaho

Montana Power Company  
Butte, Montana

Agricultural Experiment Station  
North Montana Branch Station  
Havre, Montana

Montana State Highway Dept.  
East Glacier, Montana

National Park Service  
Yellowstone National Park  
Glacier National Park

Montana Experiment Station  
Montana State College  
Bozeman, Montana

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Portland, Oregon

Montana State School of Forestry  
Montana State University  
Missoula, Montana

Soil Conservation Service  
Montana, Wyoming, Idaho

Soil Conservation Districts  
Montana Counties

Johnson Flying Service, Inc.  
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Water Rights Branch  
Dept. of Lands & Forests  
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Department of Northern Affairs  
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with the Snow Survey"*